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AUTHOR Berlin, Brent; And Others
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ABSTRACT

Attempts have been made by linguists and anthropologists to reconstruct aspects of culture history by using synchronically derived lexical data. Related to this concern with culture history is one which attempts to explore the diachronic processes of lexical change over time. As a result of a comparative survey of Tzeltal and Tzotzil ethnobotanical knowledge, this paper presents evidence which demonstrates a positive correlation between lexical retention of plant names and the cultural significance of plant segregates to which plant names refer. While the present study is restricted to the semantic domain of ethnobotany of two languages, it is suggested that the principles at work are general to the ethnobiological lexicon of all languages. (Author/CLK)

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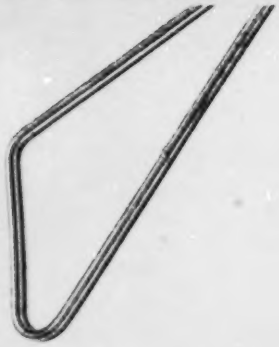

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Working Paper #29

LEXICAL RETENTION AND CULTURAL SIGNIFICANCE IN TZELTAL-TZOTZIL COMPARATIVE ETHNOBOTANY*

Brent Berlin, Dennis E. Breedlove, and Robert M. Laughlin

1. Introduction

Linguists and anthropologists have often attempted to reconstruct aspects of culture history utilizing synchronically derived lexical data. By employing the well-understood methods of comparative reconstruction, it may thus be possible to shed some light on those aspects of a particular society's past that are otherwise forever lost.

Closely related to this concern with culture-history is one which attempts to explore as well the diachronic processes of lexical change over time. In our initial attempts at preparing a comparative survey of Tzeltal and Tzotzil ethnobotanical knowledge, we became aware that our comparative materials might be of relevance to problems of lexical change. In this paper we will present evidence which demonstrates a positive correlation between lexical retention of plant names and cultural significance of the plant segregates to which plant names refer. While restricted to the semantic domain of ethnobotany of two languages, we have every reason to believe that the principles at work here are totally general to the ethnobiological lexicon of all languages.

2. Primacy of generic names

In the ethnobiological lexicon of most, if not all, languages, one is immediately struck by the fact that the vast majority of all plant or animal names fall into one of two classes. One class is comprised of forms which are, for the most part, unique, 'single-word' expressions as might be illustrated by the terms oak, pine, spruce and maple in English folk botany. A second group of expressions is comprised of members of the first class in

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variously modified form, e.g., black oak, white pine, blue spruce, sugar maple, etc. Psychologically, examples of the first class of terms may be seen to be more "basic" than those of the second, the latter having been derived from the former, in much the same sense that the color words red, yellow and green are more basic than reddish, yellowish, and greenish.

Straightforward linguistic analysis shows the first group of simple expressions to be analyzed as unitary or unproductive composite lexemes while those of the second class are invariably productive composite lexemes (see now Berlin, Breedlove and Raven, n.d., and also Conklin 1962:122). We have chosen to refer to the former class as generic names and to the latter as specific names.

In both Tzeltal and Tzotzil, generic names constitute the majority of all plant names known by any native speaker. While our computations are yet incomplete, we feel fairly confident that the number of generic names in Tzeltal and Tzotzil approaches 500 expressions. Generic plant names are clearly the most salient expressions in this area of lexicon. Such forms are the most readily elicited from native informants in both languages and are most easily recalled by them. It is highly likely that they are the first learned plant names by the Mayan child (see Stross n.d.).

3. Comparison of generic plant names in Tzeltal and Tzotzil

An obvious task in the initial comparative ethnobotanical research in Tzeltal and Tzotzil is to determine the extent to which the two systems are similar or different at the level of generic plant names. A first goal in this regard is to isolate a set of generic names in each language which can unambiguously be treated as comparable.

3.1 The comparative inventory

One useful, but arbitrary, manner in which comparability can be attained for the data in question is to restrict comparison to those expressions in both languages which refer to identical botanical species. Names,

in either language, which refer to species not collected in the other language have been eliminated. Likewise, names which refer to species that may have been collected and named in one language but not named in the other have not been included in our comparative survey. Thus, if a Tzeltal name were matched by a Tzotzil expression, and both referred to the same botanical species, the pair was included as part of the inventory to be analyzed. For purposes of discussion, we shall refer to this inventory of paired plant names as the comparative inventory.[1]

To illustrate fully, the following pairs of generic names are examples of expressions included in the comparative inventory:

Tzeltal	Tzotzil	Botanical designation
č'ilwet	čil te? vet	Lantana hirta
may	moy	Nicotiana tabacum
cu?at wamal	pucul	Cypripedium irapeanum
móro ?išim	tukum h?ik'al	Sorghum vulgare

On the other hand, the following examples are expressions which have not been included in the comparative inventory:

Tzeltal	Tzotzil	Botanical designation
(not named)	čači?	Parmentiera edulis
cahal nič wamal	(not named)	Oenothera kunthiana
[no collections]	yit'iš šotočak	Achimenes candida
č'aben te?	[no collections]	Aeschynomene villosa

We have found that 320 generic names are matched in both languages by expressions that refer to identical botanical species. (The number of species involved is in excess of 600 as a native name may have a range of several botanical classes.)

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1. We cannot be certain that the total botanical range of any plant term has been established. Further collecting, theoretically, could always reveal an additional species not heretofore known to be included. As a working operational procedure, then, we included in our comparative inventory any pair of names which referred to at least one identical botanical species.

3.2 Analytic categories

For the Mayan cultivator, as perhaps with all societies who live close to the plant world, there are basically two types of plants: those which have cultural significance in the areas of food, shelter, medicine, personal adornment, etc., and those which have minimal or no significance in the satisfaction of these basic needs. All so called 'useful' plants, however, are not of equal cultural significance. Without question, the most critical plants, culturally speaking, are invariably cultivated. Examples would include corn, beans, squash and chili. A secondary, but critically important class are protected, such as avocados, zapotes, custard apples, native tomatoes, and certain agaves. Protected plants, while not cultivated in the strict sense, would not be as abundant without the intervention of man. A third class of plants of lesser importance includes those which may have some cultural significance but which receive no special treatment by man. Native trees exhibiting leathery bark useful as a lashing material, native grasses important as thatching and small shrubs possessing edible berries are examples of such wild plants. Finally, there is a fourth class of organisms which includes plants with little or no cultural importance in that they have minimal cultural utility.

We may classify, then, all the plants in our comparative inventory as being either (1) cultivated, (2) protected, (3) wild but having important cultural utility and (4) wild plants with low cultural significance.

A fifth category, analytically justified and which overlaps these four above classes, includes plants named by loan words which have been introduced into the area as a result of the Spanish Conquest or native plants which have come to be referred to by Spanish loan words due to Spanish influence. For obvious reasons, such expressions of Spanish origin must be eliminated prior to any search for cognate native plant names. Simple loans and expressions containing loan words are thus isolated and treated separately in all of the following computations.

The category of plants with low cultural importance requires some elaboration. In terms of a literal interpretation of cultural significance, no plant which receives a name can be said to be insignificant. However, the often assumed proposition that all named plants have, by definition, some cultural utility is patently false. Many plants in our data are simply weeds which appear to be named primarily for the purpose of classifying this aspect of the environment. They are neither pestiferous nor culturally useful in any way. Man is by nature a classifying animal and the Tzeltal and Tzotzil are no exceptions.

With the exception of oaks, for which considerable effort is spent in procurement due to their good quality as a firewood, the use of a tree's wood as a fuel has been ignored here as contributing to its cultural significance. We feel this is justified as, with few exceptions, almost anything that will burn can be used as a firewood. Thus, for a non-cultivated, non-protected plant to qualify as having cultural utility, it must be utilized significantly for some other cultural need in addition to its occasional use as a firewood.

Given the distribution of the 320 generic names in our comparative inventory, we removed expressions which included elements of Spanish origin. There are 64 paired expressions in the comparative inventory which contain Spanish loan words in one or both of the two Mayan languages. Thirty-nine of the paired names of the 64 expressions are clearly cognate, indicating their common source of introduction, e.g., Tze ʔalčaš--Tzo ʔalašaš 'orange' <OSp / naránšaṣ / naranjas. Twelve pairs exhibit a Spanish loan in Tzeltal which is matched by a native term in Tzotzil, e.g., Tze kuliš--<OSp /kóleṣ / coles 'cabbage'--Tzo ʔitah 'greens'. Ten pairs of terms show a native Tzeltal name mapped by a Spanish loan in Tzotzil, e.g., Tze ščekul--Tzo bertulaka < Sp /portuláka / portulaca (Portulaca oleracea). Finally, three pairs show expressions of Spanish origin in each language which derive from different etyma, e.g., Tze kuliš bok lit. 'cabbage greens'

(see above OSp / kóleş / --Tzo čikario - Sp /čikário / chicario "chikory'. These 64 sets of names which show important Spanish influence in the two languages are discussed more fully in Appendix 2.

By removing paired names of Spanish origin from our inventory, we arrive at a set of 256 pairs of native names. The distribution of these 256 generic names when seen in terms of the four analytic categories of cultural significance may now be reported in Table 1.

Table 1

Comparative Inventory of Native Generic Names
in Tzeltal and Tzotzil as Seen in Terms of Cultural Significance

Cultivated	16	(6 percent)
Protected	36	(14 percent)
Wild-useful	115	(45 percent)
Wild-insignificant	89	(35 percent)
Total	256	

A question which is immediately raised by our classification of names in the comparative inventory into the four analytic categories is the extent to which such a distribution is characteristic of the inventory of generic names in both of the two languages. That is to say, might not our comparative sample be biased in the direction of collections of cultivated plants, or the like?

In order to clarify this issue, we classified all of the generic names in Tzeltal and Tzotzil in terms of the four analytic categories of cultural significance. We have attested 465 generic names in Tzeltal, 395 of which can be shown to be of native origin. Tzotzil has a total generic inventory of 510 names, 370 of which are native origin. The distribution of Tzeltal and Tzotzil generics given our four analytic categories can now be shown in Table 2.

Table 2

Distribution of Tzeltal and Tzotzil Generic Names in Terms of Cultural Significance

	Tzeltal	Percent	Tzotzil	Percent
Cultivated	21	5	21	6
Protected	37	9	43	11
Wild-useful	178	45	203	55
Insignificant	159	41	103	28
	395		370	

It can be observed from comparing Table 1 and Table 2 that the distribution of generic names in each of the individual languages is quite close to the distribution observed in the comparative inventory. This can be seen more readily in Figure 2. The major difference in our comparative sample reflects the fact that a larger number of wild plants have a reported cultural use in Tzotzil than in Tzeltal. This difference most probably reflects the differing research emphasis of the two ethnographers working in Tzeltal and Tzotzil. Fuller ethnographic information concerning plant use in Tzeltal might well increase the number of names in that language which refer to culturally significant wild plants.[2]

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2 When the cultural significance of a pair of plants in the comparative inventory differed, we arbitrarily rated the pair as falling within the category representing the highest cultural significance. Differences as to ratings of cultural significance occurred almost exclusively in the wild-useful and insignificant categories, the Tzotzil plant in the set usually being said to have significance while the Tzeltal plant was said to be insignificant. We feel that we are justified in treating such pairs as significant for reasons outlined above. Generally, most of the wild-plants rated as useful in Tzotzil are of purported medicinal value, a good deal of this information being elicited from Tzotzil curers with specialized knowledge. The ratings of wild-useful plants for the Tzeltal come from a sample of the general population which is, to our knowledge, not biased for specialized knowledge of Tzeltal curers. However, it is highly probably--in fact, likely--that many of the plants related in Tzeltal as insignificant will be seen to have medicinal value when extensive eliciting is carried out with native curers.

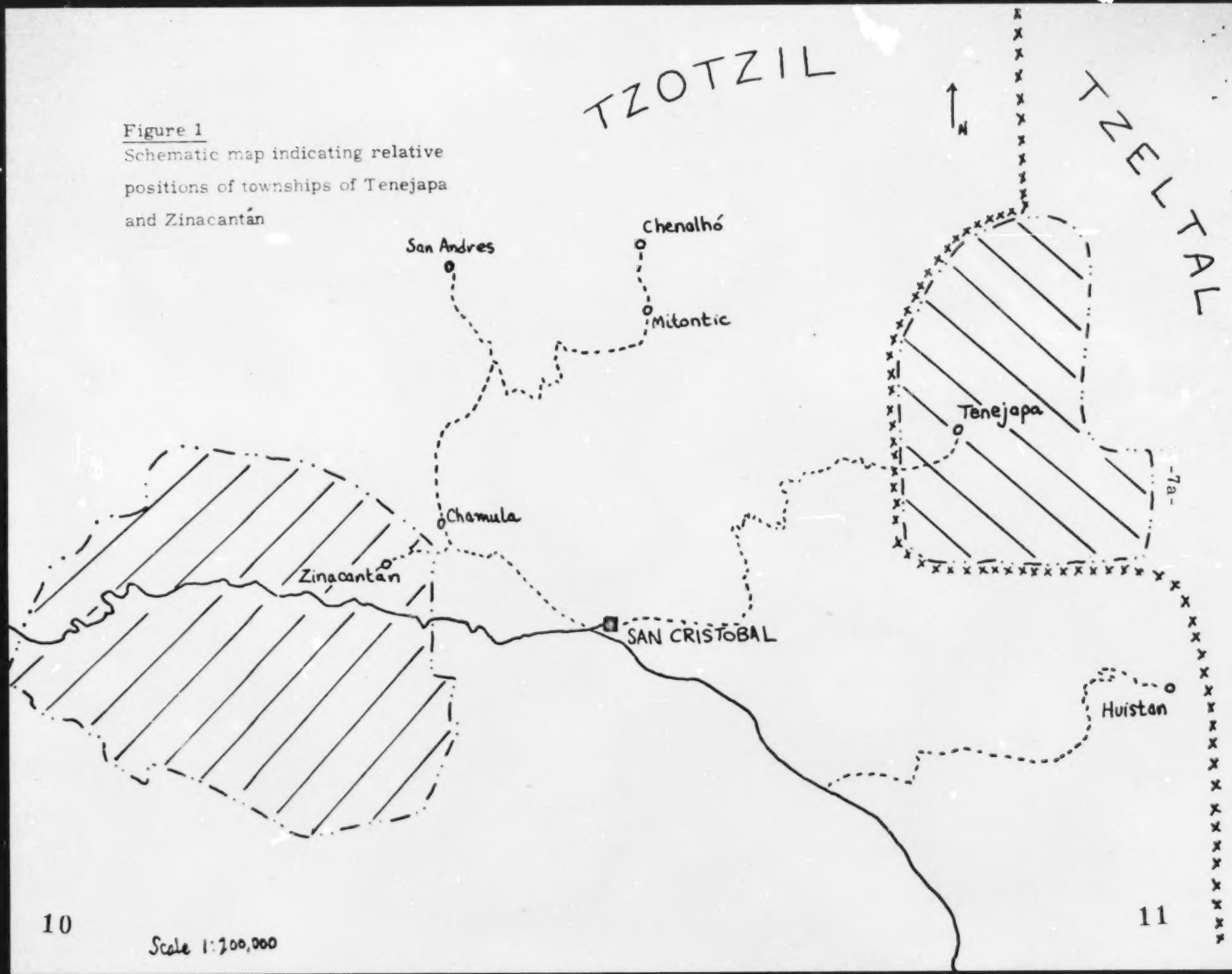
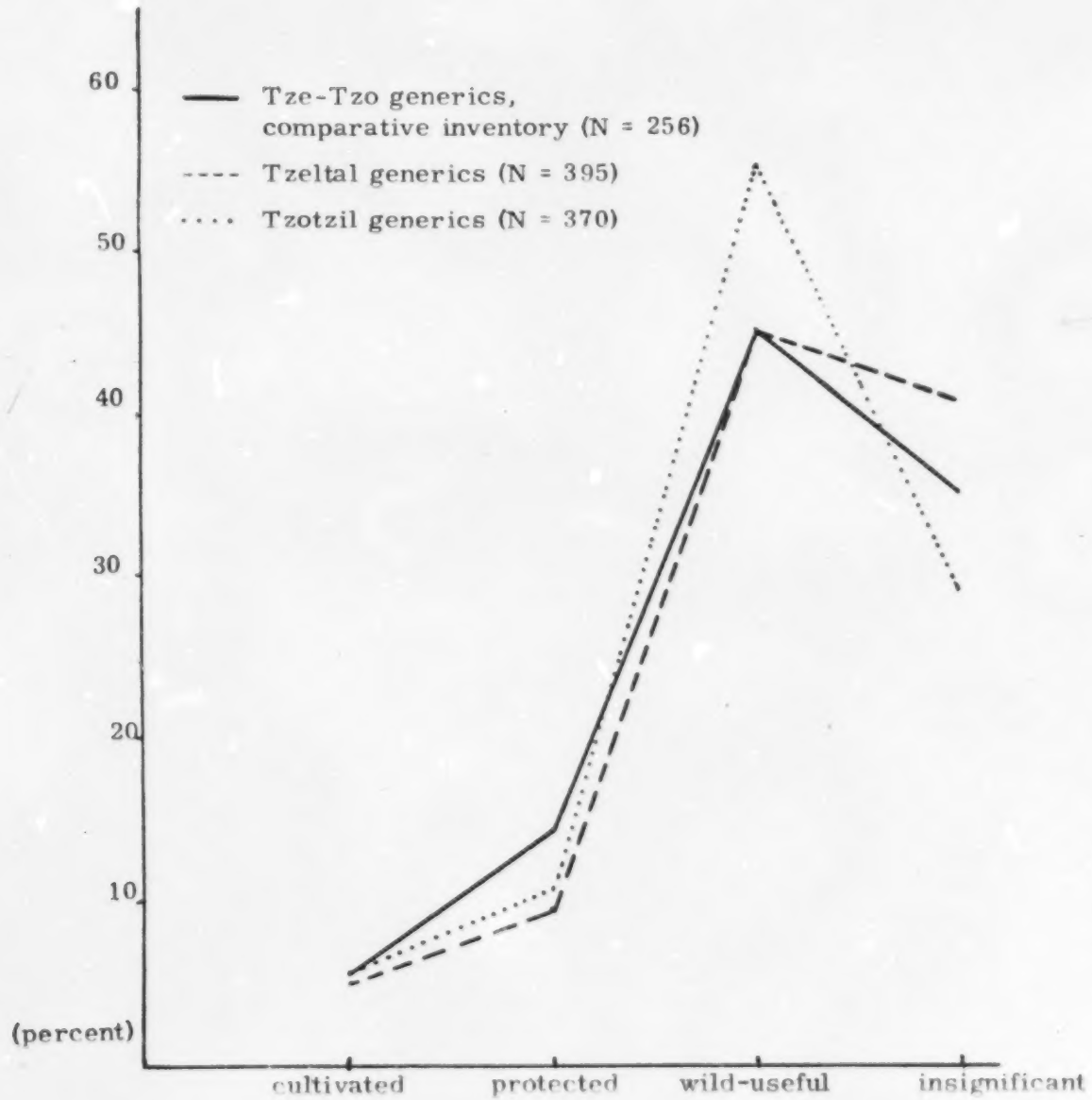


Figure 1
Schematic map indicating relative positions of townships of Tenejapa and Zinacantán

Figure 2

Individual Distribution of Total Native Generic Names
in Tzeltal and Tzotzil as Compared With
the Distribution of Generic Names in Comparative Inventory



3.3 Establishing cognate sets of Tzeltal-Tzotzil plant names

Recently, the phonological development of Tzeltal and Tzotzil has been explored carefully by Kaufman (1962a, 1962b), who has presented us with a clear picture of proto-Tzeltal-Tzotzil phonology. Building on this work, Hopkins (n.d.) has provided an excellent cultural-linguistic reconstruction of the major Tzeltal-Tzotzil dialects. The research of these two Mayanists makes the comparative linguistic aspect of our ethnobotanical efforts considerably easier.

Hopkins (n.d.) suggests that the proto-Tzeltal-Tzotzil speech community from which both the Tzeltal and Tzotzil languages are decended began to diverge into two separate groups around 260 A.D., or about 1,700 years ago. Furthermore, "The branch that became Tzotzil had begun to develop internal varieties by about 650 A.D., the Tzeltal branch had begun to divide by about 1200 A.D." (ibid.).

Tenejapa Tzeltal, according to Hopkins, belongs to one of the three "dialect clusters" of Tzeltal, a grouping which includes Oxchuc, Chanal, Abasolo and Cancuc.

Likewise, Zinacantán Tzotzil is included in one of the four major dialect groupings established for that language, along with Chamula, Mitontic and San Pedro Chenalhó.

The Central Tzeltal dialect cluster, of which Tenejapa is a member, and the Central Tzotzil dialect cluster, of which Zinancantán is a member, represent speech communities that form a continuous chain of adjacent municipios. However, linguistic and social anthropological data collected by members of the Chicago, Harvard and Stanford projects in the Chiapas Highland area over the last fifteen years, indicate that borrowing of indigenous lexical items across language boundaries is a relatively rare occurrence. Speaking specifically of the dialect groupings found within each language, Hopkins notes: "While borrowing of features from dialect to dialect has taken place, borrowing is responsible for only a minor part

of the linguistic similarity of the members of each dialect cluster. Rather, the similarity is due to the genetic connection between the dialects" (ibid.). The same can be said, even more strongly, for the two respective languages under consideration.

As a consequence of these linguistic and cultural factors, we feel confident that forms which exhibit regular phonological and semantic correspondences can be said to be cognate and represent the direct inheritance in each instance of lexical items characteristic of proto-Tzeltal-Tzotzil.

An examination of the 256 generic plant names found in the comparative inventory allows for the recognition of forms exhibiting several types of correspondences. A total of 110 pairs, or about 43 percent, have been designated as genuine cognate sets. Some, to our thinking, are unambiguous in all respects, e.g., the phonological identities cu 'bottle gourd', c'inte? 'yuca', and ?iç 'chili pepper'. Others show non-identical but regular phonemic correspondence, e.g., Tze tah--Tzo toh 'pine', Tze lo?bal--Tzo lo?bol 'banana', Tze may--Tzo moy 'tobacco', and Tze mahtas--Tzo matas 'beggar ticks'.

Some plant names exhibit skewed or infrequent correspondences which might suggest to the hard-nosed historical linguist that they do not ultimately derive from the same source. Examples of such expressions include Tze moen--Tzo ?unen mu 'nightshade' (cf. Chuj mu), Tze s-c'oc' --Tzo pic'oc (Monnina xalapense), Tze siban--Tzo ?isbon 'dogwood'. We have nevertheless included these forms as cognates.

There are a number of generic names which may ultimately prove to be cognate but which, for the time being, we have not treated as such. Most of these are compound names for which a portion of the name is cognate, but non-cognate in the remaining constituents. To illustrate, there are certain generic names in Tzeltal and Tzotzil which are comprised of two or more root morphemes, normally of the form (n) + n + n. It is

common that the head constituent of such compounds, invariably the last, is one of the morphemes used to refer to higher order taxa in each of the respective languages, i.e., Tze--Tzo te? 'tree', Tze-Tzo ?ak' 'vine', Tze ?ak--Tzo hobel 'grass and sedge', and Tze wamal--Tzo c'i?lel 'herbaceous plant'. There are numerous instances where one will find regular phonological correspondences in the first constituents of a pair of expressions, but with the appropriate major class term utilized in the second constituent. Thus, for example, we find the sets:

Tzeltal	Tzotzil
yašal ničˇ wamal	yašal ničˇ c'i?lel
cic wamal	cic c'i?lel
cuhkum ?ak	cukum hobel
k'un ?ak	k'un hobel

A final group of forms which we have not recognized as cognate but which may later prove to be so are sets of polymorphemic generic names which are linked by only a single constituent. Examples are as follows:

Tzeltal	Tzotzil
pucil ničˇim	pucul c'i?lel
cacames	sat mes
?učˇ'il ha?	yučˇ'ul vo?
bot'bot wamal	bot'hol c'i?lel
čˇ'abakal	bakal c'i?lel
cilcil ?uhčˇ	cis ?učˇ
nuk'balil honon	nočˇleb vonon

4. Relationship of cultural significance of plants to lexical retention of plant names.

An assumed, but rarely stated hypothesis in historical linguistic work is that lexical expressions which refer to aspects of culture which

are especially significant are least subject to change through time. This assumption is, in fact, at the very base of the Swadesh lexico-statistical word list and has been followed by anthropologists and comparative linguists who have attempted to reconstruct culture history utilizing synchronically derived lexical data (cf. Longacre and Millon 1961, McQuown 1964, Kaufman 1964).

If such a hypothesis is generally valid, it should be equally applicable to a well-defined semantic domain such as plant lexicon. Thus, in making a comparative linguistic study of names for plants, one should expect support for the following hypothesis:

Given two languages which are known to have descended from a common parent and which are spoken by societies dependent on an intimate knowledge of the plant world for their survival, one will find, in general, that as the two languages diverge:

a) shared names for plants of little cultural significance in the parent language will be rapidly lost;

b) shared names in the parent language for wild useful plants which require little attention by man will be lost less rapidly than wild culturally insignificant plants; and

c) names for cultivated and protected plants will be least effected as separation occurs and will be retained as cognates in the respective languages.

A ready and easily computed test of the hypothesis can be made by comparing the distribution of the 110 cognate and 146 non-cognate native plant names in our comparative inventory of 256 items in terms of the four categories of cultural importance. This distribution is seen in Table 3.

Table 3

Comparison of Cognate and Non-Cognate Sets of Plant Names in Terms of Cultural Importance

	Cognate		Non-Cognate
Cultivated	14	(13%)	2
Protected	29	(26%)	7
Wild-useful	52	(47%)	63
Insignificant	15	(14%)	74
	110		146

Total 256

In terms of the percentage of cognate forms in each category, we note that 13% of all cognates are cultivated, 26% are protected, 47% are will-useful and 14% are insignificant.

A graphic representation of these results may be seen in Figure 3 which allows for the comparison of the distribution of generic names in the two languages and the comparative inventory to that found for the 110 cognate sets.

The hypothesis appears to be strongly supported, as can be seen from Table 3 and Figure 3. Figure 3 indicates that twice the percentage of cognates are found for cultivated plants than expected in the comparative inventory (13% and 6%, respectively); almost twice the percentage of cognates are found for protected plants than that expected in the comparative inventory (26% vs 14%); cognates for wild-protected plants are approximately the same as expected (47% vs 45%) and there are considerably fewer cognates for wild-insignificant plants than expected (14% vs 35%).

Another way of stating these results is to compute the percentages of cognate names for each analytic category. Nicholas A. Hopkins has suggested the following Figure 4 as representing a summary of the findings.

Figure 3

Comparative Summary of the Distribution of Generic Names in the Two Respective Languages and the Comparative Inventory With That Found for the Inventory of 100 Cognate Sets

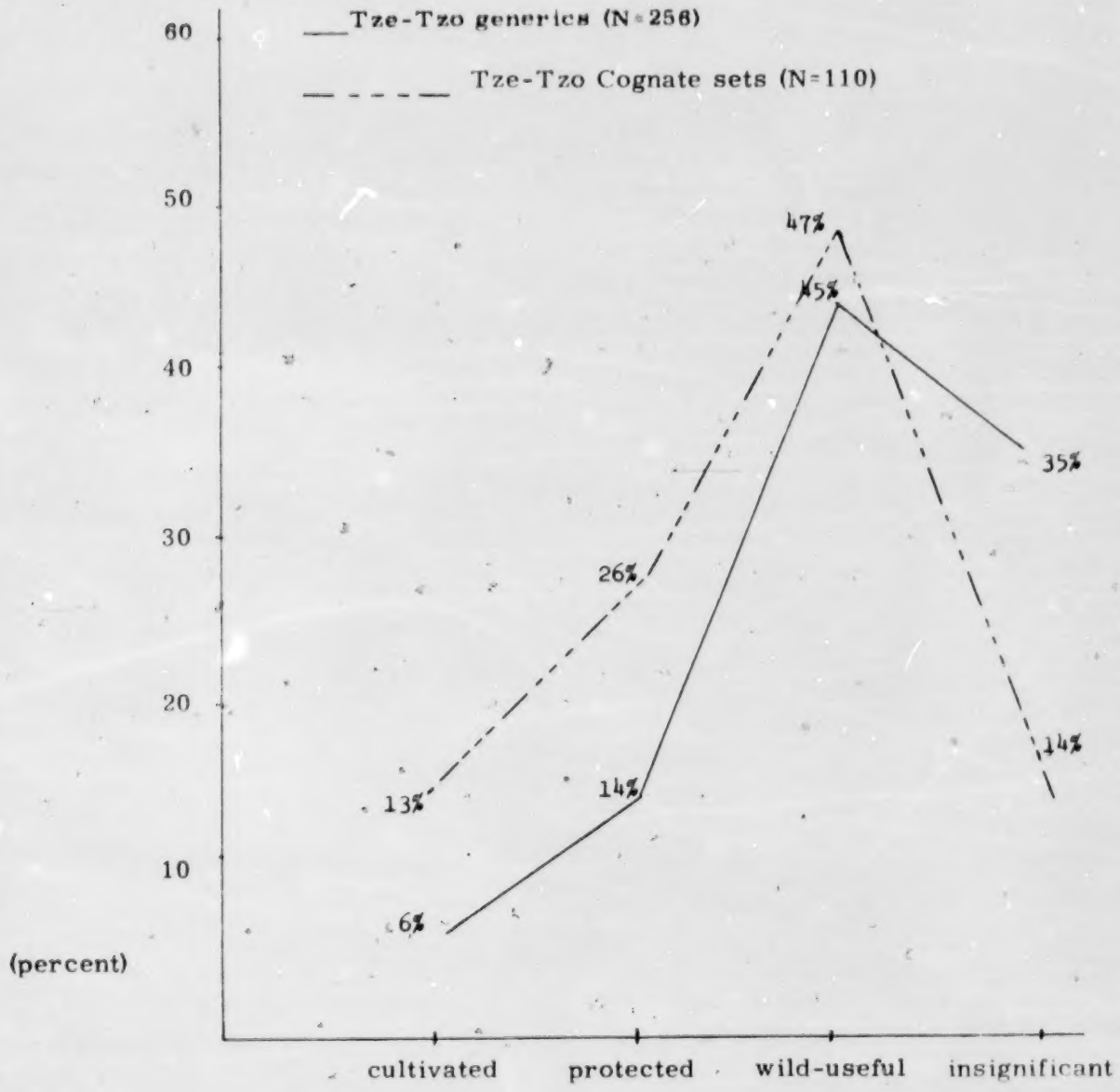
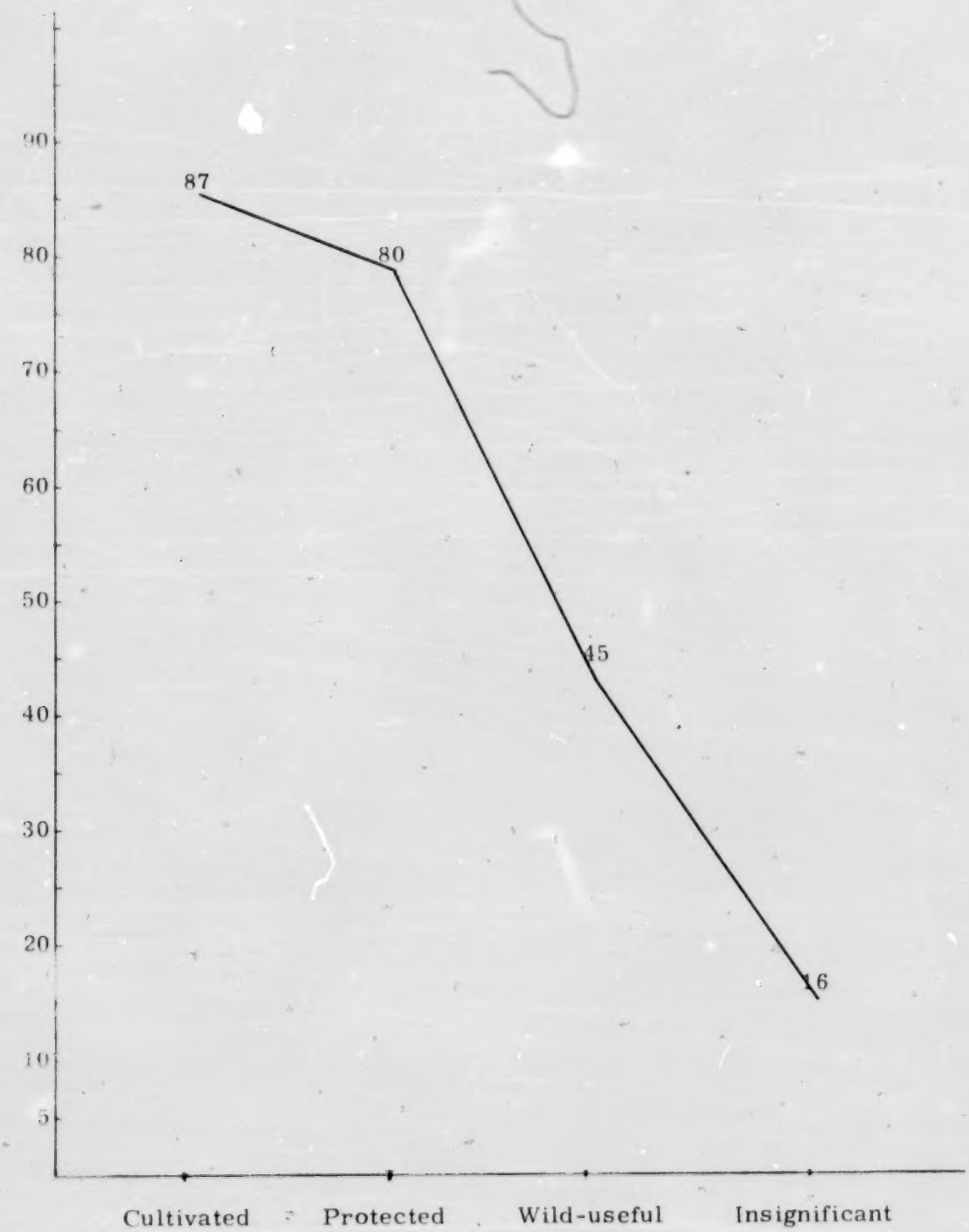


Figure 4

Percentage of Tzeltal-Tzotzil Cognate Plant Names
in Each of the Four Analytic Categories



Thus, Figure 4 reveals that

a) Names referring to wild plants of low cultural significance have apparently been rapidly lost as the two languages diverged. From a total of 89 plant names in the comparative inventory which refer to wild plants of little importance, 15, or only 16 percent, have cognate names.

b) Names referring to wild useful plants that receive no special treatment fair somewhat better: Of the 115 plants representing wild-useful types, 52, or about 45 percent, are cognate. Wild useful plants are retained twice as often as wild plants.

c) Names for protected plants have been little effected by change. Of the 36 protected plant names included in the comparative inventory, 29, or 80 percent, have been retained as cognates.

d) Finally, names for cultivated plants have been least effected as the two languages diverged over time. Of the 16 cultivated plants, 14, or 87 percent, have cognate names.

It seems clear that names for plants of high cultural importance represent the most conservative names in the ethnobotanical lexicon of the two languages. There is no reason to assume that this conclusion is not totally general to the ethnobiological lexicon of all languages.

It might be pointed out that the two non-cognate sets for cultivated plants are the words for 'cotton' and 'pineapple' (Tze tunim--Tzo tušnuk'; Tze pahč'--Tzo pašak'). Both sets indicate that Tzotzil has been innovative in this respect, replacing proto-Tzeltalan terms with Tzotzilisms, as both tunim and pahč' reconstruct in proto-Mayan as *tinëm and *pahk'. The root tuš appears as the proto-Mayan term for 'cotton seed' (Kaufman 1964:99).

Notes

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Appendix 1

Cognate Sets and Comparative Reconstruction of
Proto-Tzeltal-Tzotzil Generic Plant Names

The following inventory presents reconstructions for the 110 sets of plant names in our data which have been designated as cognate expressions. The order of presentation is in terms of the four analytic categories of cultural significance: cultivated plants, protected plants, wild-useful plants, and insignificant plants.

Specific names have not, as a general rule, been reconstructed although there are numerous instances where it would have been possible to do so. On the other hand, several important names for beans are clearly cognate and we have indicated these expressions in this inventory. They have not been counted, however, in any of the computations indicated earlier in the paper.

Following Kaufman (1962b:150), the segmental phonemes of proto-Tzeltal-Tzotzil are as follows:

plain stops and affricates	p	t	c	č	k	?	
glottalized stops and affricates	p'	t'	c'	č'	k'		
voiced glottalized stop	b'						
fricatives			s	š	x	h	
nasals	m	n					
semivowels	w	y					
lateral		l					
vowels	i		e	a	A	o	u

I. Proto-Tzeltal-Tzotzil names referring to cultivated plants.

1. BANANA [Musa paradisiaca L.]

*lo?bAl — Tze lo?bal

Tzo lo?bol

2. BEAN [Phaseolus spp.]

*čenek' — Tze čenek'

Tzo čenek'

*š?ak'il čenek' [P. vulgaris L.]

Tze š?ak'il čenek'

Tzo š?ak'il čenek'

*[s]bohtil čenek' [P. formosus HBK., P. coccineus L.]

Tze šboht'il čenek' [sic]

Tzo botil čenek'

*šlumil čenek' [P. vulgaris L.]

Tze šlumil čenek'

Tzo šlumil čenek'

*šut čenek' [P. leiosepalus Piper]

Tze šut čenek'

Tzo šut čenek'

*šwet' čenek' [P. lunatus L.]

Tze šwek' čenek'

Tzo šwet' čenek' [sic]

3. BOTTLE GOURD [Lagenaria siceraria (Mol.) Standl.]

*cuh — Tze cu

Tzo cu

4. CHAYOTE [Sechium edule (Jacq.) Sw.]

*č'umahte?	Tze č'umate?
	Tzo č'umte?

5. CHILI PEPPER [Capsicum spp.]

*?ič	Tze ?ič
	Tzo ?ič

6. CORN [Zea mays L.]

*?išim	Tze ?išim
	Tzo ?išim

7. MARIGOLD [Tagetes erecta L.]

*tus	Tze tusus	(cf. Chuj túsus, K'ekchi' tus, tuc')
	Tzo vo?tus	

8. POTATO [Solanum tuberosum L.]

*?is?ak'	Tze ?is?ak' či?in
	Tzo ?is-ak'

9. PUMPKIN SQUASH [Cucurbita moschata Duch.]

*č'um	Tze č'um
	Tzo č'um

10. SUGARCANE [Saccharum officinarum L.] <'CANE'

*wale?	Tze wale?
	Tzo vale?

11. SUMMER SQUASH [Cucurbita pepo L.]

*c'ol	Tze c'ol
	Tzo c'ol

12. TOBACCO [Nicotiana tabacum L.]

*mAy	Tze may
	Tzo moy

13. WATERMELON SQUASH [Cucurbita ficifolia Bouché]

*mayil	Tze mayil
	Tzo mayil

14. YUCA CASSAVA [Manihot spp.]

*c'inte?	Tze c'inte?
	Tzo c'inte?

[sets 1 BANANA and 10 SUGARCANE are early word coinages identical for both languages. They cannot be proto-Tzeltal-Tzotzil as the two plants were probably introduced shortly after the Spanish Conquest.]

II. Proto-Tzeltal - Tzotzil names referring to protected plants.

15. ACACIA [Acacia angustissima (Mill.) Kuntze]

*šašib — Tze šašib

Tzo šašib

16. AGAVE$_1$ [Agave sp.]

*čih — Tze či

Tzo či

17. AGAVE$_2$ [Furcraea sp., Agave sp.]

*met — Tze met < Aztec metl

Tzo met

18. AMARANTH PIGWEED [Amaranthus hybridus L., A spinosus L.]

*(š)c'ul — Tze sc'ul

Tzo c'ul ?itah

19. ANATTO TREE, ACHIOTE [Bixa orellana L.]

*ho?oš — Tze ho?oš

Tzo vo?oš

20. AVOCADO$_1$ [Persea americana L.]

*cic — Tze cic

Tzo cic te?

21. AVOCADO$_2$ [Persea americana L.]

*?on — Tze ?on

Tzo ?on

22. CANNA [Canna edulis Ker]

*(š)č'uč'	Tze šč'uč'i haben	
	Tzo č'uč'	

23. CORAL BEAN [Erythrina chiapasana Krukoff]

*(š)ʔuhkum	Tze ʔuhkum	
	Tzo šʔukun	

24. CUSTARD APPLE [Annona cherimola Miller]

*k'eweš	Tze k'eweš	
	Tzo k'eveš	

25. CYPRESS [Cupressus lusitanica Mill.]

*nuhkul pat	Tze nuhkupat	
	Tzo nukul pat	

26. DEADLY NIGHTSHADE [Solanum nigrum L., S. nodiflorum Jacq., S. douglasii Dunal]

*muh	Tze moen	(cf. Chuj múh)
	Tzo ʔunen mu	

27. ELDERBERRY [Sambucus mexicana Presl.]

*čixil teʔ	Tze čihil teʔ	
	Tzo čihil teʔ	

28. GUAVA (Psidium guajava L.)

*pAtAh	Tze pata	< Mixe-Zoque
	Tzo potov	

29. HAWTHORN [Crataegus pubescens (HBK.) Steud.]

*č'iš	Tze č'iš te?
	Tzo č'iš

30. INCENSE TREE [Bursera tomentosa (Jacq.) Tr. and Pl.]

*pom	Tze pom
	Tzo pom

31. MEXICAN TEA, EPAZOTE [Chenopodium ambrosioides L. var. ambrosioides]

*kAhkA?An	Tze kahk'an
	Tzo koko?on

32. PATERNA [Inga spuria H. & B.]

*c'elel	Tze c'elel
	Tzo c'erel

33. PRICKLY - PEAR [Opuntia spp.]

*pehtAk	Tze pehtak
	Tzo petok

34. QUICK WEED [Galinsoga caracasana (DC.) Sch. Bip.]

*?uskum	Tze ?uskum
	Tzo ?uskun-te?

35. RATTLE BOX [Crotalaria spp.]

*č'aben	Tze č'aben
	Tzo č'aben

36. RED SAPOTE [Pouteria mammosa (L.) Cronq.]

ha?as	Tze ha?as
	Tzo ha?as

37. SON SAPOTE [Licania platypus Fritsch.]

*mac'am c'oc'	Tze mac'am c'oc'
	Tzo mac'an c'oc'

38. SWEET MARIGOLD [Tagetes lucida Cav., T. schiedeana Less.]

*cic	Tze cic ?ak
	Tzo cic

39. TREE GOURD, JICARA [Crescentia cujete L.]

*cima	Tze cima
	Tzo cima? < Mixe-Zoque

40. WHITE SAPOTE [Casimiroa edulis Llave & Lex.]

*?aha(w)=te?	Tze ?ahate?
	Tzo ?ahte?

41. WILD ONION [Allium kunthii G. Don]

*tuhiš ?ak	Tze tuš?ak
	Tzo tuiš ka? (cf. Chuj túyal)

42. WILLOW [Salix taxifolia HBK., S. chilensis Mol., S. bonplandiana HBK.]

*tok'oy	Tze tok'oy
	Tzo tok'oy

43. YELLOW ZAPOTE [Pouteria campechiana]

*noʔčiʔ	Tze noʔčiʔ
	Tzo nočiʔ

III. Proto-Tzeltal - Tzotzil names referring to wild- useful plants.

44. ALDER [Alnus ferruginea Kunth, A. arguta (Schlecht.)Spach]

*nAhk	Tze nahk
	Tzo nok

45. BEGGAR TICKS [Bidens pilosa L., B. ostruthioides (DC.) Sch. Bip.]

*mahtas	Tze mahtas
	Tzo matas

46. BRUSH CHERRY [Eugenia acapulcensis Steud.]

*č'iht	Tze č'iht
	Tzo č'it

47. BUTTERFLY BUSH [Buddleia crotonoides Gray]

*celepat	Tze celepat
	Tzo celepat

48. CASTOR BEAN [Ricinus communis L.]

*č'upakte?	Tze čopakte?	[identical word formation but introduced after the Conquest]
	Tzo č'upak' te? [sic]	

49. CAT TAIL [Typha latifolia L.]

*špuh	Tze špuh
	Tzo puh

50. COYOTE BUSH [Baccharis vaccinioides HBK.)

*meste?	Tze meste?
	Tzo mes te?

51. DAHLIA [Dahlia imperialis Roezl ex Ortigies, D. coccinea Cav.

*č'oliw	Tze č'oliw
	Tzo č'oliv

52. DODDER [Cuscuta tinctoria Engelm.]

*k'an ?ak'	Tze k'an?ak'
	Tzo k'anak'

53. DOGWOOD [Cornus excelsa Kunth]

*sibAn	Tze siban
	Tzo ?isbon

54. EPIPHYTIC MOSSES

*conte?	Tze conte?
	Tzo conte?

55. FAIRY DUSTER [Calliandra grandiflora (L'Her) Benth., C. houstoniana (Mill.) Kuntze]

*č'ič'ni?	Tze č'ič'ni?
	Tzo č'ič' ni?

56. FAN PALM [Brahea dulcis (HBK) Mart.]

*šan	Tze šan
	Tzo šan

57. FERN [numerous species]

*cib	Tze cib
	Tzo cib

58. FLEA BANE [Erigeron karvinskianus DC.]

*pošil sal	Tze pošil sal
	Tzo pošil sal c'i?

59. HAUYA [Hauya elegans HBK.]

*pAtAhte?	Tze patate?
	Tzo potov te?

60. HELIOCARPUS [Heliocarpus donnell-smithii Rose]

*bAt	Tze bat
	Tzo bot

61. HOP HORNBEAM [Ostrya guatemalensis (Winkl.) Rose]

* c'utohte?	Tze c'utohte?
	Tzo c'utuh te?

62. HORSETAIL [Equisetum spp.]

*tuht	Tze tuht
	Tzo tut

63. JOE-PYE WEED [Eupatorium ligustrinum DC.]

*č'ate?	Tze č'ahte?
	Tzo č'a-te?

64. KIDNEY WOOD [Eysenhardtia adenostylis Baill.]

*k'ante?	Tze k'ante?
	Tzo k'an-te?

65. COYOL PALM [Acrocomia mexicana Karvinsky ex Mart.]

*nap	Tze nap
	Tzo nap

66. LANTANA [Lantana hirta Grah., L. hispida HBK.]

*č'ilwet	Tze č'ilwet
	Tzo č'il vet

67. LIVE OAK [Quercus acatenangensis Trel., Q. mexicana H. & B.]

*čikin?ib	Tze čikinib
	Tzo čikin-ib

68. MADRONE [Arbutus xalapensis HBK.]

*?onte?	Tze ?onte?
	Tzo ?on te?

69. MEADOW RUE [Thalictrum guatemalense C. DC. & Rose]

*cis čauk	Tze cis čauk
	Tzo cis čauk

70. MEXICAN SHELL FLOWER [Tigridia spp.]

* yoy	Tze yoy
	Tzo koyoy

71. MONNINA [Monnina xalapense Kunth]

(š)č'oc'	Tze sc'oc'
	Tzo pic'oc'

72. NETTLE [Urtica urens L., Tragia nepetifolia Cav. Gronovia scandens L. Cnidoscolus aconifolius (Mill.) I. M. Johnst.]

*lah	Tze la
	Tzo la

73. NIGHT SHADE [Solanum somniculentum Kunze]

*yič xox	Tze yič hoh
	Tzo yič hoh

74. OAK [Quercus candicans Neé]

*sakyok	Tze sakyok hihte?
	Tzo sapyok [sic]

75. PACAYA [Chamaedorea spp.]

*č'ib	Tze č'ib
	Tzo čib

76. PEPPER [Piper spp.]

*mumun	Tze mumunte?
	Tzo mumun

77. PEPPER GRASS [Lepidium spp.]

*pič'	Tze pič'pič'
	Tzo pič'

78. PINE [Pinus spp.]

*tAx	Tze tah
	Tzo toh

79. POK BERRY [Phytolacca octandra L. P. rugosa A. Br. & Bouché]

*(š)ʔob	Tze šʔob
	Tzo ʔob

80. SAURAUIA [Saurauia scabrida Hemsl. S. oreophila Hemsl.]

*ʔaxoxteʔ	Tze ʔahohteʔ
	Tzo ʔahohteʔ

81. SOAPROOT [Cyclanthera langaei Cogn.]

*poloc'	Tze poloc'
	Tzo poloc'

82. SUMAC [Rhus schiedeana Schlecht., R. terebinthifolia Cham & Schlecht.]

*paxʔul	Tze pahʔulʔul
	Tzo pahʔul

83. TILLANDSIA [Tillandsia spp., Pitcairnia breedlovei L. B. Smith]

*ʔeč' Tze ʔeč'

Tzo ʔeč'

84. TETHONIA [Tithonia tubaeformis (Jacq.) Cass., T. scaberrima Benth., T. diversifolia (Hemsl.) A. Gray]

*sun Tze sun

Tzo sun

85. TOURNEFORTIA [Tournefortia acutiflora Mart. and Gal.]

*tɹhil teʔ Tze tuil teʔ

Tzo tuil teʔ

86. SPIDER FLOWER [Cleome magnifica Briq.]

*pax ʔitax Tze paʔitah

Tzo paʔ ʔitah

87. TREMA [Trema micrantha (L.) Blume]

*waš ʔak' Tze waš ʔak'

Tzo vaš ʔak'

88. VIRGIN'S BOWER [Clematis grossa Benth.]

*ʔič ʔak' Tze ʔičil ʔak'

Tzo ʔič ʔak'

89. WAX MALLOW [Malvaviscus arboreus Cav. var arboreus]

*šc'oban Tze sc'oban

Tzo c'oban c'iʔlel

90. WILD BLACKBERRY [Rubus spp.]

*makom	Tze makum
	Tzo makom

91. WILD FIG [Ficus cotinifolia HBK.]

*mutut	Tze mutut
	Tzo mutut

92. WILD GOURD [Lagenaria siceraria (Mol.) Standl.]

*č'a(h)k'o?	Tze č'ahk'o?
	Tzo č'ak'o?

93. WILD GRAPE [Vitis bourgaeana Planch.]

*c'usub	Tze c'usub
	Tzo c'usub

94. WILD YAM, BARBASCO [Dioscorea floribunda]

*p'uhk	Tze p'uhk
	Tzo p'uk

95. WINTERGREEN [Gaultheria odorata Willd.]

*?axete ?es	Tze ?ahate?es
	Tzo ?ahate?es

IV. Proto-Tzeltal-Tzotzil names referring to wild-insignificant plants.

96. CLUB MOSS [Lycopodium clavatum L.]

*šanšan	Tze šanšan wamal
	Tzo šanšan

97. CLUSIA [Clusia rosea Jacq.]

*pikinte?	Tze pikinte?
	Tzo pik'inte? [sic]

98. CYCLANTHERA [Cyclanthera bourgaeana Naud. ex Char.]

*č'umte? č'o	Tze č'umate? č'o
*č'uma(h)=te?	Tzo č'umte? č'o

99. EUPHORBIACEAE

*k'olomaš	Tze k'olomaš	
	Tze k'olomaš te?	[this item added after computations had been completed. It does not effect the results of the hypothesis]

100/ GAMA GRASS [Tripsacum laxum Nash]

*ših	Tze ši haben
	Tzo ši mo

101. LAGASCEA [Lagascea helianthifolia HBK]

*sox	Tze soh
	Tzo soh

102. LIABUM [Liabum glabrum var hypoleucum Greenm.]

*šcuy Tze scuy

Tzo suil ?itah [sic]

103. RANDIA [Randia aculeata L.]

*cima č'iš Tze č'iš cima

Tzo cima? č'iš

104. RATTLE BOX [Crotalaria maypurensis HBK.]

*č'aben čix Tze č'aben čih

Tzo č'aben čih

105. SABADILLA [Schoenocaulon officinale (Schl. & Cham.) Gray]

*k'ašib (cognate?) Tze č'ašib ?ak

Tzo k'ašib hobel

106. SHRUB COPPER LEAF [Acalypha unibracteata Myell. Arg.]

*caxal te? Tze cahalte?

Tzo cahalte?

107. SITIT [Vernonia deppeana Less]

*sitit Tze sitit

Tzo sitit

108. SPIDER WORT [Commelina spp., Epidendrum ibagense HBK., Tradescantia spp.]

*c'eman Tze c'eman

Tzo c'emeni? [sic]

109. SPOT FLOWER [Spilanthes americana (L. f.) Hieron.]

*šc̆ ak'ak' Tze šc̆ak'ak'

Tzo čak'ak' c'i?lel

110. WILD SOAP ROOT [Anthericum vestitum Baker, Echeandia parviflora Baker]

*č'opak xox Tze č'opak hoh

Tzo č'upak' hoh cf. 48

111. XYLOSMA [Xylosma flexuosum (HBK) Hemsl.]

*yisim bAhlAm Tze yisim balam

Tzo yi sim bolom

Appendix 2

Loan Words and Loan Expressions in Tzeltal-Tzotzil

Plant Names

This appendix includes all those pairs of names which have elements of Spanish origin in either one or both of the two languages. The vast majority of expressions refer to plants not native to the New World and brought into the Chiapas Highlands as a direct result of the Spanish Conquest. A smaller number refer to native plants which have assumed Spanish names due to their importance in trade with the Ladino population.

A major portion of the plants in this inventory are cultivated by both the Tzeltal and Tzotzil pupulations of Tenejapa and Zinacantán. Some plants, however, are primarily Ladino cultigens and are known to the Mayan Indian only as he comes in contact with their useful fruits or leaves in the market plazas. Unless otherwise marked , a name can be assumed to refer to non-native plants cultivated by Mayan Indians.

I. Cognate loans and loan expressions in Tzeltal and Tzotzil

1. ANGEL'S TRUMPET [Datura candida (Pers.) Pasq.]

Tze kampána ničim

Tzo kampana ničim </kampána/

2. APPLE [Malus pumila Miller]

Tze mancana

Tzo mancana </mansána/

3. BEET [Beta vulgaris L.]

Tze betawel

Tzo metabel </betabél/

cultivated by Ladinos

4. BLACK MUSTARD [Brassica juncea (L.) Coss.]

Tze mustisa

Tzo mustisya </mostása/

protected milpa associate

5. BORAGE [Borago officinalis L.]

Tze boreha wamal

Tzo boraha </borágo/

6. CALLA LILY [Zantedeschia aethiopica (L.) Spreng.]

Tze kartúčo ničim

Tzo kartučo </kartúčo/

7. CARDINAL FLOWER [Lobelia laxiflora HBK] New World plant

Tze pirima nahk

Tzo primon </prímo/

8. CARROT [Daucus carota L. var sativa]

Tze sana?ória

Tzo sanoria </sanaória/

9. COCONUT [Cocos nucifera L.] known only from markets

Tze kóko

Tzo koko

10. COFFEE [Coffea arabica L.]

Tze kahpeh

Tzo kahve </kafé/

11. CORIANDER [Coriandrum sativum L.]

Tze kulántu

Tzo kulantu </silándro/

12. EUCALYPTUS [Eucalyptus spp.] cultivated by Ladinos

Tze kampor

Tzo kampor </kampór/

13. FIELD MUSTARD [Brassica campestris L.] protected milpa associate

Tze napuš

Tzo napuš <OSp/nábos/ 'turnip' [sic]

14. FIG [Ficus carica L.]

Tze ?ik'o [sic]

Tzo ?ik'uš [sic] < OSp /íkoṣ/

15. GARLIC [Allium sativum L.]

Tze ?ašuš

Tzo yašuš ka? < OSp /ášoṣ/

16. LIME [Citrus aurantifolia (Christm.) Swingle]

Tze ?elemoneš

Tzo ?elamoniš < OSp /limónes/

17. MALLOW [Malva parviflora L.] insignificant weed

Tze malba

Tzo malva </málba/

18. MANGO [Mangifera indica L.]

Tze manko

Tzo manko </mángo/

19. MINT [Mentha citrata Ehrh.]

Tze ?alawéna

Tzo ?alavena </yérba bwéna/

20. NANCE [Byrsonima crassifolia (L.) DC.] New World plant

Tze nancin

Tzo nanci?

21. ONION [Allium cepa L.]

Tze sewula

Tzo sevulya </sebólʸa/

22. ORANGE [Citrus sinensis (L.) Osbeck]

Tze ʔalčaš

Tzo ʔalašaš < OSp /naránšaṣ/

23. PAPAYA [Carica papaya L.]

Tze papay

Tzo papaya </papáya/

24. PEACH [Prunus persica L.]

Tze turesna

Tzo turasnu </durásno/

25. PEAR [Pyrus communis L.] Cultivated by Ladinos

Tze péra

Tzo peleš < OSp /péraṣ/

26. PLUM [Prunus domestica L.]

Tze sirwela

Tzo sirvela </sirwéla/

27. POPAPPLE [Passiflora ligularis Russ) Native to the New World

Tze karanáto

Tzo kranato </granáda/

28. RADDISH [Raphanus sativus L.] Protected milpa associate

Tze ʔalawaneš

Tzo ʔalavanuš < OSp /rábanos/

29. RAG WEED [Ambrosia cumanensis Kunth]

Tze ʔálta mísa wamal

Tzo ʔaltamiša < OSp /álta mísa/

30. ROSE [Rosa chinensis Jacq.] Cultivated by Ladinos

Tze rošoš

Tzo roša < OSp /róšas/

31. RUE [Ruta graveolens L.]

Tze lúla

Tzo lula </lúla/

32. STINKY PASSION FLOWER [Passiflora foetida L. var lanaginosa Killig]
New World plant

Tze karanáto č'o

Tzo kranata č'o < /granáda/

33. SWEET LIME [Citrus limetta Risso]

Tze líma

Tzo lima </líma/

34. VIOLET [Viola nannei Polak.] Wild weed

Tze bioleta ničim

Tzo bioléta < /bioléta/

35. WATERMELON [Citrullus vulgaris Schrad.]

Tze santia

Tzo šantia < OSp /šandía/

36. WILD CELERY [Apium leptophyllum (Pers.) F. Muell.] Wild plant

Tze kulántu č'o

Tzo kulantu č'o < /silándro/

37. WILD PASSION FLOWER [Passiflora subpeltata Ortega] New World plant

Tze karanáto ?ak'

Tzo kranata ?ak' < /granáda/

38. WITCH GRASS [Panicum maxium Jacq.]

Tze sakaton

Tzo sakaton </sakatón/

II. Pairs showing a Spanish derived expression in Tzeltal, a native expression in Tzotzil.

39. ACACIA [Acacia farnesiana (L.) Willd.]

Tze šulub wakaš č'iš < OSp /bákaṣ/

Tzo sakil č'iš

40. BOX ELDER [Acer negundo L. var mexicanum (DC.) Standl. & Steyerm.]

Tze kantéla </kantéla/

Tzo sa'til te?

41. CABBAGE [Brassica oleracea L.]

Tze kuliš < OSp /kóleṣ/

Tzo bac'i ?itah

42. DOCK [Rumex obtusifolius L.]

Tze pormiro wamal ?

Tzo pošil ?eal

43. MEDICAGO [Medicago polymorpha L.]

Tze kašlan čenek' wamal < OSp /kaštil^{y}áno·/

Tzo laclac c'i?lel

44. MONTANOA [Montanoa hexagona]

Tze šakriš te? < ?

Tzo sakil k'olk'oš

45. PLANTAIN [Plantago major L.]

Tze kuliš wamal < OSp /kóleṣ/

Tzo lante?

46. POINSETTIA [Euphorbia pulcherrima Willd. ex Klotzsch.]

Tze šela ničim < OSp /šéra/

Tzo cahal ničˇ c'i?lel

46. PUMP WOOD [Cecropia obtusifolia, C. peltata L.] Wild plant

Tze warum < /gwarúmo/

Tzo k'orok'te?

48. SORGHUM [Sorghum vulgare Pers.]

Tze móro ?išim < /móro/

Tzo tukum h?ih'al

49. THISTLE [Cirsium horridulum Michx.]

Tze ?itah wakaš <OSp /bákaṣ/

Tzo cahal č'iš

III. Pairs showing a Spanish derived expression in Tzotzil, native expression in Tzeltal.

50. BARBADOS NUT [Jatropha curcas L.]

Tze sakil te?

Tzo pinyon </pinyón/

51. BUCIDA [Bucida macrostachya Standl.]

Tze man ?ak'

Tzo kaču toro < /káčo tóro/

52. BULB STEM YUCCA [Yucca elephantipes]

Tze tim

Tzo kašlan tok'oy < OSp /kaštilyáno/

53. HOG PLUM [Spondias mombin]

Tze luluw soc'

Tzo hovos < /hóbos/

54. GROUND ORCHID [Govenia spp.]

Tze borboš

Tzo kola < /kóla/

55. JACK BEAN]Canavalia hirdutissima Sauer, C. glabra (Mart. & Gal) Sauer, Pachyrrhizus vernalis Clausen, Centrosema pubescens Benth]

Tze čenek' mut

Tzo mačita ?ak' < /mačéte/

56. PURSLANE [Portulaca oleracea L.]

Tze šček̆ul

Tzo bertulaka < /portuláka/

57. SPURGE [Euphorbia graminea Jacq.]

Tze k'anču?il wamal

Tzo ničim santo < / sánto/

58. VALERIAN [Valeriana densiflora Benth.]

Tze pošil ?alal

Tzo voy múla < /múla/

59. WAX MYRTLE [Myrica cerifera L.] native plant

Tze č'ahk'olol

Tzo satin /sátin/

IV. Pairs exibiting non-cognate Spanish derived expressions in both languages.

60. DANDELION [Taraxacum officinale Webb.] Weed

Tze kuliš pimil wakaš	</koleṣ/ /bákaṣ/
Tzo spuc'taob ša von k'oš etik	</šapon/

61. SOW THISTLE [Sonchus oleraceus.]

Tze kuliš pimil	< /kóleṣ/
Tzo čikario/	</čikário/

62. WHEAT [Triticum aestivum L.]

Tze kašlan ?išim	</kaštilʸáno/
Tzo triko	</trigo/